CLAIMS

What is claimed is:

1. A backup server for enabling a data communications network to recover from a local server failure, said data communications network including a network access server (NAS) for coupling a call placed from a call-in user to said data communications network and a failure detector for detecting said local server failure, said NAS having associated memory, said NAS connected to said network, said backup server comprising:

a server-state attribute (SSA) receiver responsive to the failure detector for receiving from the associated memory an information packet associated with the call upon an occurrence of the local server failure, wherein said information packet characterizes a plurality of SSA information data associated with the call placed to the NAS by the call-in user;

a memory reader for reading said information packet from said SSA receiver; and

a parser for reconstructing said plurality of SSA information data from said information packet from said memory reader, so that the backup server can recover the call to the data communications network.

2. A backup server according to claim 1 wherein said information packet consists of an attribute/value pair that can be parsed into a plurality of separate data entries.

3. A backup server according to claim 1 wherein said information packet further comprises a plurality of aggregated data elements from a call attribute table.

4. A backup server according to claim 3 wherein said plurality of aggregated data elements of said information packet are separated by said parser for reconstructing said plurality of SSA information data from said information packet.

5. A backup server for enabling a data communications network to recover from a local server failure, said data communications network including a network access server (NAS) for coupling a call placed from a call-in user to said data communications network, said NAS having associated memory, said backup server comprising:

a failure detector for detecting said local server failure;

a server-state attribute (SSA) receiver responsive to said failure detector for receiving from the associated memory an information packet associated with the call upon an occurrence of the local server failure, wherein said information packet characterizes a plurality of SSA information data associated with the call placed to the NAS by the call-in user;

a memory reader for reading said information packet from said SSA receiver; and

a parser for reconstructing said plurality of SSA information data from said information packet from said memory reader, so that the backup server can recover the call to the data communications network.

6. A backup server according to claim 5 wherein said information packet consists of an attribute/value pair that can be parsed into a plurality of separate data entries.

7. A server backup mechanism according to claim 5 wherein said information packet further comprises a plurality of aggregated data elements from a call attribute table.

8. A backup server according to claim 7 wherein said plurality of aggregated data elements of said information packet are separated by said parser for reconstructing said plurality of SSA information data from said information packet.

9. A local server for enabling a data communications network to recover from a local server failure, said data communications network including a network access server (NAS) for coupling a call placed from a call-in user to said data communications network and a failure detector for determining if said local server failure has occurred, said NAS having an associated memory, said NAS connected to said network, said local server comprising:

an encoder for generating an information packet associated with the call, wherein said information packet characterizes a plurality of server-state attribute (SSA) information data associated with the call; and

a sender for transmitting said information packet associated with the call from said encoder to the associated memory.

10. A local server according to claim 9 wherein said information packet consists of an attribute/value pair that can be parsed into a plurality of separate data entries.

11. A local server according to claim 9 wherein said information packet further comprises a plurality of aggregated data elements from a call attribute table.

12. A local server according to claim 11 wherein said plurality of aggregated data elements of said information packet are separated by said parser for reconstructing said plurality of SSA information data from said information packet.

13. A server enabling a data communications network to recover from a local server failure, said data communications network including a network access server (NAS) for coupling a call placed from a call-in user to said data communications network and a failure detector for determining if said local server failure has occurred, said NAS having an associated memory, said NAS connected to the network, said server comprising:

an encoder for generating an information packet, wherein said information packet characterizes a plurality of server-state attribute (SSA) information data associated with the call;

a sender for transmitting said information packet from said encoder to the NAS to which the call is coupled for storing in the associated memory;

a receiver responsive to the failure detector for receiving from the associated memory an information packet associated with the call upon an occurrence of the local server failure, wherein said information packet characterizes a plurality of SSA information data associated with the call;

a memory reader for reading said information packet from said SSA receiver; and

a parser for reconstructing from said information packet associated with the call into a plurality of SSA information data so that the backup server can recover the call to the data communications network.

14. A server according to claim 13 wherein said information packet consists of an attribute/value pair that can be parsed into a plurality of separate data entries.

15. A server according to claim 13 wherein said information packet further comprises a plurality of aggregated data elements from a call attribute table.

16. A server according to claim 15 wherein said plurality of aggregated data elements of said information packet are separated by said parser for reconstructing said plurality of SSA information data from said information packet.

17. A network access server (NAS) for enabling a data communications network to recover from a local server failure and for coupling a call placed from a call-in user to said data communications network, said data communications network including a local server for generating an information packet, wherein said information packet characterizes a plurality of server-state attribute (SSA) information data associated with said call, and a backup server for parsing said information packet to recover said plurality of SSA information data in the event that said local server failure occurs, said local server, said backup server and said NAS being connected to said network, said NAS comprising:

a receiver for receiving the information packet from the local server;

an associated memory for recording the information packet;

a memory writer for writing the information packet from said receiver to said associated memory;

a failure detector for determining if the local server failure has occurred;

a memory reader for reading the information packet from said associated memory; and

a sender for transmitting the information packet from said memory reader to the backup server if the local server failure has occurred.

18. A NAS according to claim 17 wherein said information packet consists of an attribute/value pair that can be parsed into a plurality of separate data entries.

19. A NAS according to claim 17 wherein said information packet further comprises a plurality of aggregated data elements from a call attribute table.

20. A server backup system for enabling a network to recover a call placed by a call-in user to said network from a server access failure, said network including a memory connected to said network and a failure detector connected to the network for determining whether said server access failure has occurred, said memory and said failure detector both associated with a network access server (NAS) that is connected to said network, said system comprising:

a server connected to the network for servicing the call;

an encoder for generating an information packet that characterizes a plurality of server-state attribute (SSA) information data associated with the call;

a receiver responsive to the failure detector for reading said information packet from the memory associated with the NAS, said receiver associated with said server, said information packet in the memory upon an occurrence of the local server failure; and

a parser for reconstructing said plurality of SSA information data from said information packet, and providing said plurality of SSA information data to said server, said parser associated with said server.

21. A server backup system according to claim 20 wherein said information packet consists of an attribute/value pair that can be parsed into a plurality of separate data entries.

22. A server backup system according to claim 20 wherein said information packet further comprises a plurality of aggregated data elements from a call attribute table.

23. A server backup system according to claim 22 wherein said plurality of aggregated data elements of said information packet are separated by said parser for reconstructing said plurality of SSA information data from said information packet.

24. A server backup mechanism according to claim 20 wherein said server is a resource pool manager server (RPMS).

25. A server backup system for enabling a network to recover a call placed by a call-in user to said network from a server access failure, said network including a memory connected to said network, said memory associated with a network access server (NAS) that is connected to said network, said system comprising:

a server connected to the network for servicing the call;

an encoder for generating an information packet that characterizes a plurality of server-state attribute (SSA) information data associated with the call;

a sender for transmitting said information packet from said encoder to the memory associated with the NAS, said sender associated with said server;

a failure detector for determining whether the server access failure has occurred, said failure detector associated with said server;

a data-caller responsive to said failure detector for requesting said information packet from the memory associated with the NAS, said data-caller associated with said server;

a receiver responsive to said data-caller for reading said information packet from the memory, said receiver associated with said server, said information packet in the memory upon an occurrence of the local server failure; and

a parser for reconstructing said plurality of SSA information data from said information packet, and providing said plurality of SSA information data to said server, said parser associated with said server.

26. A server backup system according to claim 25 wherein said information packet consists of an attribute/value pair that can be parsed into a plurality of separate data entries.

27. A server backup system according to claim 25 wherein said information packet further comprises a plurality of aggregated data elements from a call attribute table.

28. A server backup system according to claim 27 wherein said plurality of aggregated data elements of said information packet are separated by said parser for reconstructing said plurality of SSA information data from said information packet.

29. A server backup system according to claim 25 wherein said server is a resource pool manager server (RPMS).

30. A server backup system for enabling a network to recover a call placed by a call-in user to said network from a server access failure, said network including a memory connected to said network and a failure detector connected to the network for determining whether said server access failure has occurred, said memory and said failure detector both associated with a network access server (NAS) that is connected to said network, said system comprising:

a first server connected to the network for servicing the call;

a second server connected to the network for servicing the call if the server access failure occurs;

an encoder for generating an information packet, said encoder associated with said first server, wherein said information packet characterizes a plurality of server-state attribute (SSA) information data associated with the call, said information packet further comprising a plurality of aggregated data elements from a call attribute table;

a sender for transmitting said information packet from said encoder to the memory associated with the NAS, said sender associated with said second server;

a receiver responsive to the failure detector associated with the NAS for reading said information packet from the memory upon an occurrence of the local server

failure, said receiver associated with said second server, said information packet in the memory ; and

a parser for reconstructing said plurality of SSA information data from said information packet, and providing said plurality of SSA information data to said second server, said parser associated with said second server.

31. A server backup system according to claim 30 wherein said second server further includes:

a data-caller responsive to the failure detector for requesting said information packet from the memory associated with the NAS.

32. A server backup system according to claim 31 wherein said first server is a resource pool manager server (RPMS) and said second server is a backup RPMS.

33. A method performed by a backup server for enabling a network to recover a call placed by a call-in user to said network from a server access failure, said network including a local server, said backup server, a memory connected to said network, an information packet generator connected to said network for generating an information packet that characterizes a plurality of server-state attribute (SSA) information data associated with the call placed by said call-in user to said network, and a failure detector connected to said network for determining whether said server access failure has occurred, said memory and said failure detector both associated with a network access server (NAS) that is connected to said network, said local server at least initially

connected to said network, said backup server connected to said network, said method comprising:

receiving the information packet from the memory associated with the NAS, said receiving being responsive to the failure detector when the server access failure occurs; and

parsing the information packet to reconstruct said plurality of SSA information data for the call.

34. A method performed by the backup server according to claim 33 wherein the backup server is responsive to the failure detector when the server access failure occurs, said method further comprising:

petitioning to the NAS for the information packet after the NAS requests the plurality of SSA information data;

receiving the information packet from the memory; and

sending said plurality of SSA information data to the NAS after parsing the information packet is completed.

35. A method performed by the backup server according to claim 33 wherein said parsing the information packet further includes:

reading a value data string and subdividing said value data string into a plurality of data fields.

36. A method performed by a local server for enabling a network to recover a call placed by a call-in user to said network from a server access failure, said network

including a memory connected to said network, a failure detector connected to the network for determining whether said server access failure has occurred, said local server, and a backup server, said memory and said failure detector both associated with a network access server (NAS) that is connected to said network, said local server at least initially connected to said network, said backup server connected to said network, said NAS sending an information packet from said memory to said backup server in response to said failure detector, said backup server parsing the information packet to reconstruct said plurality of server-state attribute (SSA) information data for said call, said method comprising:

generating an information packet that characterizes the plurality of SSA information data associated with the call placed by the call-in user to the network; and

sending the information packet to the NAS to be stored in the associated memory.

37. A method performed by the local server according to claim 36 wherein said generating an information packet further comprises:

encoding a plurality of aggregated data elements from a call attribute table representing said plurality of server-state attribute (SSA) information data; and

delimiting information packet into an attribute data string and a value data string.

38. A method performed by a network access server (NAS) for enabling a network to recover a call placed by a call-in user to said network from a server access failure, said network including an associated memory connected to said network, a failure detector connected to the network for determining whether said server access failure has occurred, a local server, and a backup server, said associated memory and said failure

detector both associated with the NAS that is connected to said network, said local server at least initially connected to said network, said backup server connected to said network, said local server generating an information packet that characterizes a plurality of server-state attribute (SSA) information data associated with the call placed by said call-in user to said network, said backup server parsing the information packet to reconstruct said plurality of SSA information data for said call, said method comprising:

receiving the information packet from the local server by a receiver;

recording the information packet in the associated memory;

writing the information packet from said receiver to the associated memory;

determining if the local server failure has occurred by the failure detector;

reading the information packet from the associated memory by a memory reader; and

transmitting the information packet from the memory reader to the backup server if the local server failure has occurred.

39. A method performed by a server for enabling a network to recover a call placed by a call-in user to said network from a server access failure, said network including said server connected to said network, a memory connected to said network and a failure detector connected to the network for determining whether said server access failure has occurred, said memory and said failure detector both associated with a network access server (NAS) that is connected to said network, said method comprising:

generating an information packet that characterizes a plurality of server-state attribute (SSA) information data for the call placed by the call-in user to the network;

sending the information packet to the NAS to be stored in the memory associated with the NAS;

receiving said information packet from the memory associated with the NAS, said receiving being responsive to the failure detector when the server access failure occurs; and

parsing said information packet to reconstruct said plurality of SSA information data for the call.

40. A method performed by the server according to claim 39 wherein the server is a resource pool manager server (RPMS).

41. A method performed by the server according to claim 39 said server is responsive to the failure detector when the server access failure occurs, said method further comprising:

petitioning said information packet to the NAS after receiving a request from the NAS for the plurality of SSA information data;

receiving said information packet from the memory; and

sending said plurality of SSA information data to the NAS after parsing said information packet is completed.

42. A method performed by the server according to claim 39 wherein said generating an information packet further comprises:

encoding a plurality of aggregated data elements from a call attribute table representing said plurality of SSA information data; and

delimiting the information packet into an attribute data string and a value data string.

43. A method performed by the server according to claim 39 wherein said parsing said information packet further includes:

reading a value data string and subdividing said value data string into a plurality of data fields.

44. A programmable storage device readable by a machine tangibly embodying a program of instructions executable by the machine to perform method steps performed by a backup server for enabling a network to recover a call placed by a call-in user to said network from a server access failure, said network including a local server, said backup server, memory connected to said network, an information packet generator connected to said network for generating an information packet that characterizes a plurality of server-state attribute (SSA) information data for said call placed by said call-in user to said network, and a failure detector connected to said network for determining whether said server access failure has occurred, said memory and said failure detector both associated with a network access server (NAS) that is connected to said network, said local server at least initially connected to said network, said backup server connected to said network, said method comprising:

receiving the information packet from the memory associated with the NAS, said receiving being responsive to the failure detector when the server access failure occurs; and

parsing the information packet to reconstruct said plurality of SSA information data for the call.

45. A programmable storage device according to claim 44 wherein the backup server is responsive to the failure detector when the server access failure occurs, said method further comprising:

petitioning to the NAS for the information packet after the NAS requests the plurality of SSA information data;

receiving the information packet from the memory to the backup server; and

sending the plurality of SSA information data to the NAS after parsing the information packet is completed.

46. A programmable storage device according to claim 44 wherein said parsing the information packet further includes:

reading a value data string and subdividing said value data string into a plurality of data fields.

47. A programmable storage device readable by a machine tangibly embodying a program of instructions executable by the machine to perform method steps performed by a local server for enabling a network to recover a call placed by a call-in user to said network from a server access failure, said network including a memory connected to said network, a failure detector connected to the network for determining whether said server access failure has occurred, said local server, and a backup server, said memory and said failure detector both associated with a network access server (NAS) that is

connected to said network, said local server at least initially connected to said network, said backup server connected to said network, said NAS sending an information packet from said memory to said backup server in response to said failure detector, said backup server parsing the information packet to reconstruct said plurality of server-state attribute (SSA) information data for said call, said method comprising:

generating an information packet that characterizes the plurality of SSA information data for the call placed by the call-in user to the network; and

sending the information packet to the NAS.

48. A programmable storage device according to claim 47 wherein said generating an information packet further comprises:

encoding a plurality of aggregated data elements from a call attribute table representing the plurality of SSA information data; and

delimiting information packet into an attribute data string and a value data string.

49. A programmable storage device readable by a machine tangibly embodying a program of instructions executable by the machine to perform method steps performed by a network access server (NAS) for enabling a network to recover a call placed by a call-in user to said network from a server access failure, said network including an associated memory connected to said network, a failure detector connected to the network for determining whether said server access failure has occurred, a local server, and a backup server, said associated memory and said failure detector both associated with the NAS that is connected to said network, said local server at least initially connected to said network, said backup server connected to said network, said local

server generating an information packet that characterizes a plurality of server-state attribute (SSA) information data associated with the call placed by said call-in user to said network, said backup server parsing the information packet to reconstruct said plurality of SSA information data for said call, said method comprising:

receiving the information packet from the local server by a receiver;

recording the information packet in the associated memory;

writing the information packet from said receiver to the associated memory;

determining if the local server failure has occurred by the failure detector;

reading the information packet from the associated memory by a memory reader; and

transmitting the information packet from the memory reader to the backup server if the local server failure has occurred.

50. A programmable storage device readable by a machine tangibly embodying a program of instructions executable by the machine to perform method steps by a server for enabling a network to recover a call placed by a call-in user to said network from a server access failure, said network including said server connected to said network, a memory connected to said network and a failure detector connected to the network for determining whether said server access failure has occurred, said memory and said failure detector both associated with a network access server (NAS) that is connected to said network, said method comprising:

generating an information packet that characterizes a plurality of SSA information data for the call placed by the call-in user to the network;

sending the information packet to the NAS to be stored in the memory associated with the NAS;

receiving said information packet from the memory associated with the NAS, said receiving being responsive to the failure detector when the server access failure occurs; and

parsing said information packet by said server to reconstruct said plurality of SSA information data for the call.

51. A programmable storage device according to claim 50 said server is responsive to the failure detector when the server access failure occurs, said method steps further comprising:

petitioning said information packet to the NAS after receiving a request from the NAS for said plurality of SSA information data;

receiving said information packet from the memory; and

sending said plurality of SSA information data to the NAS after parsing said information packet is completed.

add claim ASY